School of Environmental and Life Sciences

EXSS3050: Applied Exercise Physiology and Training

Ourimbah
Semester 2 - 2023

COURSE OUTLINE

OVERVIEW

Course Description

Continued advancements in refined training methods, technology and monitoring practices on exercise across a range of populations has widened the scope and resources available to exercise scientists when working with clients and athletes. The application and interpretation of assessments and responses to exercise training requires a detailed understanding of physiological system function and supporting evidence to maximise training adaptations. The prescription of training programs should be led by the available evidence and initial assessments and guided through training monitoring and adaptation data. By the end of this course, students should be able to write a detailed exercise program targeted at improving performance that is under-pinned by evidence and current technology.

Prior to Semester 2 2021, this course was named Applied Exercise Physiology.

Requisites

Students must have successfully completed EXSS2010 AND EXSS2050 to enrol in EXSS3050.

Contact Hours

Ourimbah
Laboratory *
Face to Face On Campus
2 hour(s) per Week for Full Term

Online Activity
Online
2 hour(s) per Week for 12 Weeks starting Week 1

* This contact type has a compulsory requirement.

Unit Weighting

10

Workload

Students are required to spend on average 120-140 hours of effort (contact and non-contact) including assessments per 10 unit course.

CONTACTS

Course Coordinator

Ourimbah
Dr Mitch Naughton
Mitch.Naughton@newcastle.edu.au
Consultation: By appointment

Teaching Staff

Other teaching staff will be advised on the course Canvas site.

School Office

School of Environmental and Life Sciences
SO-104 Science Offices
OURIMBAH
Science-SELS@newcastle.edu.au
(02) 4349 4568 / (02) 4348 4115
9am-5pm (Mon-Fri)

SYLLABUS

Course Content

- Training monitoring and periodisation
- Physiological, biochemical and genetic adaptations to exercise
- Advanced exercise prescription
- Evidence-based practice for sport and exercise
- Sport and exercise technology

Course Learning Outcomes

On successful completion of this course, students will be able to:

1. Evaluate and apply key concepts of periodisation, training monitoring and data analysis to construct and monitor the effectiveness of training programs (ESSA 4.2.1, ESSA 4.2.2).
2. Integrate the physiological principles that explain exercise adaptation, fatigue and training dysfunction (ESSA 3.2.1).
3. Describe the normal physiological responses to acute and chronic exercise training and evaluate they are affected by external influences (ESSA 3.2.2).
4. Analyse and interpret physiological data obtained during exercise between time points, individuals and populations (ESSA 3.2.4).
5. Prescribe and deliver an evidence-based exercise intervention for specific populations that is supported through appropriate behavioural change strategies and technology (ESSA 4.2.10; ESSA 4.2.11; 4.2.12).
6. Critically evaluate data and use evidence-based practice and scientific rationale to underpin decision making in service delivery (ESSA PA 6).

Course Materials

Recommended Text:

- Kenney, W.L., Wilmore, D. and Costill, J. (2021). Physiology of Sport and Exercise. Human Kinetics, Champaign, IL.
- Joyce, D. and Lewindon, D. (2021) High Performance Training for Sports. Human Kinetics, Champaign, IL.

Recommended Reading:

- Specific references will be made available through the Library's online services.

COMPULSORY REQUIREMENTS

In order to pass this course, each student must complete ALL of the following compulsory requirements:

Contact Hour Requirements:

- Laboratory There is a compulsory attendance requirement in this course. Students must attend 80% of scheduled laboratories.

- Laboratory Induction Requirement - Students must attend and pass the induction requirements before attending these sessions. In order to participate in this course, students must complete a compulsory lab induction and safety induction (testing equipment usage).

SCHEDULE

Week	Week Begins	Topic	Learning Activity	Assessment Due
1	17 Jul	Review of Exercise Physiology and Evidence Based Practice	Advanced Laboratory Assessments	
2	24 Jul	Energy Systems and Metabolism	Advanced Laboratory Assessments	Online Task (2%), due 09:00am 27 July
3	31 Jul	Intensity-Duration Relationships and Acute and Chronic Responses to Exercise	Speed-Duration and Power-Duration Assessment and Programming	Online Task (2%), due 09:00am 3 Aug
4	7 Aug	Physiological Basis of Fatigue	Monitoring Training Loads and Fatigue	Online Task (2%), due 09:00am 10 Aug
5	14 Aug	Anaerobic Energy Systems and Training	Anaerobic Assessments and Programming	Online Task (2%), due 09:00am 17 Aug
6	21 Aug	Aerobic Energy Systems and Training	Aerobic Assessments and Programming	Online Task (2%), due 09:00am 24 Aug
7	28 Aug	Training for Strength and Power	Advanced Gym Assessments and Programming	Online Task (2%), , due 09:00am 31 Aug
8	4 Sep	Clinical Exercise Rehabilitation	Delivering Clinical Rehabilitation as an Exercise Scientist	Online Task (2%), due 09:00am 7 Sep
9	11 Sep	Training for Hypertrophy and Mobility	Blood Flow Restriction Training and Programming	Online Task (2%), due 09:00am 14 Sep
10	18 Sep	Advanced Physical Training	Flywheel Training and Prescription - Case Study	Online Task (2%), due 09:00am 21 Sep
Mid Term Break				
Mid Term Break				
11	9 Oct	Training for Extreme and Aquatic Environments	Hypoxic Training and Prescription - Case Study	Online Task (2%), due 09:00am 12 Oct
12	16 Oct	Inclusive Exercise Assessments and Prescription	Prescribing and Delivering Exercise for an Inclusive Environment	Case Study Essay/Written assignment (25%)
13	23 Oct	No Lectures	Review Session	Lab Workbook (25%)
Examination Period				
Examination Period				Formal Exam (30%)

ASSESSMENTS

This course has 4 assessments. Each assessment is described in more detail in the sections below.

	Assessment Name	Due Date	Involvement	Weighting	Learning Outcomes
1	Examination: Formal	Formal Exam Period	Individual	30%	1, 2, 3, 6
2	Laboratory Exercises	Friday, Week 13 (27th October)	Individual	25%	1, 4, 5, 6
3	Essays/Written assignments	Friday, Week 12 (20th October)	Pair	25%	1, 2, 3, 4, 5
4	Online Quizzes	Weekly (Each quiz will need to be completed prior to the first laboratory session [09:00am] on the Thursday of each required week)	Individual	20%	1, 2, 4

Late Submissions The mark for an assessment item submitted after the designated time on the due date, without an approved extension of time, will be reduced by 10% of the possible maximum mark for that assessment item for each day or part day that the assessment item is late. Note: this applies equally to week and weekend days.

Assessment 1 - Examination: Formal

Assessment Type Formal Examination
Purpose To assess students content knowledge and critical thinking skills around exercise assessment, prescription, and delivery with regards to physiology
Description The exam will consist of both multiple choice and short answer and case study questions
Weighting 30%
Length 2 hours 10 minutes
Due Date Formal Exam Period
Submission Method Formal Exam
Assessment Criteria Marks will be awarded for correct answers
Return Method Not Returned
Feedback Provided In Person - Upon request.

Assessment 2 - Laboratory Exercises

Assessment Type Tutorial / Laboratory Exercises
Purpose Submission of practical workbook which assesses competency of practical skill and data analysis. Further, the workbook will contain various case studies that students will be challenged with in classes.
Description Students will be required to submit activities demonstrating completion of each laboratory session. In the event of missing a lab, even with adverse circumstances, students will be required to complete the work.
Weighting 25%
Due Date Friday, Week 13 (27th October)
Submission Method Online – Submission will be through CANVAS.
Assessment Criteria Marking guidelines and criteria will be provided via Canvas
Return Method Online
Feedback Provided Online - Three weeks after submission.

Assessment 3 - Essays/Written assignments

Assessment Type Written Assignment
Purpose Students will be presented with a case study that they must undertake a number of activities around designing testing batteries, training monitoring and programming. The purpose of the assessment is to ensure students are able to work with a simulated client to develop an individualised approach to exercise assessment, prescription and delivery. Students will need to provide a physiological rationale to demonstrate their evidence-based practice.
Description In pairs, students will be required to complete a needs analysis, develop a periodisation plan, testing battery, training monitoring system and 6-week exercise program for a case study. Students must provide physiological evidence as to why their program is suitable, ecologically

	valid and best-practice for the respective case studies.
Weighting	25%
Length	2000 words + Exercise programs
Due Date	Friday, Week 12 (20th October)
Submission Method	Online
Assessment Criteria	Marking rubric will be provided on CANVAS.
Return Method	Online
Feedback Provided	Online - Three weeks after submission.

Assessment 4 - Online Quizzes

Assessment Type	Quiz
Purpose	To ensure content knowledge and pre-laboratory learning has been undertaken.
Description	Each online task will consist of multiple choice questions, tasks and other activities.
Weighting	20%
Due Date	Weekly (Each quiz will need to be completed prior to the first laboratory session [09:00am] on the Thursday of each required week)
Submission Method	Online
Assessment Criteria	Marks will be awarded for correct answers.
Return Method	Online
Feedback Provided	

ADDITIONAL INFORMATION

Grading Scheme

This course is graded as follows:

Range of Marks	Grade	Description
85-100	High Distinction (HD)	Outstanding standard indicating comprehensive knowledge and understanding of the relevant materials; demonstration of an outstanding level of academic achievement; mastery of skills*; and achievement of all assessment objectives.
75-84	Distinction (D)	Excellent standard indicating a very high level of knowledge and understanding of the relevant materials; demonstration of a very high level of academic ability; sound development of skills*; and achievement of all assessment objectives.
65-74	Credit (C)	Good standard indicating a high level of knowledge and understanding of the relevant materials; demonstration of a high level of academic achievement; reasonable development of skills*; and achievement of all learning outcomes.
50-64	Pass (P)	Satisfactory standard indicating an adequate knowledge and understanding of the relevant materials; demonstration of an adequate level of academic achievement; satisfactory development of skills*; and achievement of all learning outcomes.
0-49	Fail (FF)	Failure to satisfactorily achieve learning outcomes. If all compulsory course components are not completed the mark will be zero. A fail grade may also be awarded following disciplinary action.

*Skills are those identified for the purposes of assessment task(s).

Attendance

Attendance/participation will be recorded in the following components:

- Laboratory (Method of recording: Students must attend 80% of laboratories to pass the course.)

Communication Methods

Communication methods used in this course include:

- Canvas Course Site: Students will receive communications via the posting of content or announcements on the Canvas course site.
- Email: Students will receive communications via their student email account.
- Face to Face: Communication will be provided via face-to-face meetings or supervision.

Course Evaluation

Each year feedback is sought from students and other stakeholders about the courses offered in the University for the purposes of identifying areas of excellence and potential improvement.

Oral Interviews (Vivas)

As part of the evaluation process of any assessment item in this course an oral examination (viva) may be conducted. The purpose of the oral examination is to verify the authorship of the material submitted in response to the assessment task. The oral examination will be conducted in accordance with the principles set out in the Oral Examination (viva) Procedure. In cases where the oral examination reveals the assessment item may not be the student's own work the case will be dealt with under the Student Conduct Rule.

Academic Misconduct

All students are required to meet the academic integrity standards of the University. These standards reinforce the importance of integrity and honesty in an academic environment. Academic Integrity policies apply to all students of the University in all modes of study and in all locations. For the Student Academic Integrity Policy, refer to https://policies.newcastle.edu.au/document/view-current.php?id=35.

Adverse Circumstances

The University acknowledges the right of students to seek consideration for the impact of allowable adverse circumstances that may affect their performance in assessment item(s). Applications for special consideration due to adverse circumstances will be made using the online Adverse Circumstances system where:

1. the assessment item is a major assessment item; or
2. the assessment item is a minor assessment item and the Course Co-ordinator has specified in the Course Outline that students may apply the online Adverse Circumstances system;
3. you are requesting a change of placement; or
4. the course has a compulsory attendance requirement.

Before applying you must refer to the Adverse Circumstance Affecting Assessment Items Procedure available at:
https://policies.newcastle.edu.au/document/view-current.php?id=236

Important Policy Information

The Help button in the Canvas Navigation menu contains helpful information for using the Learning Management System. Students should familiarise themselves with the policies and procedures at:
https://www.newcastle.edu.au/current-students/no-room-for/policies-and-procedures
that support a safe and respectful environment at the University.

This course outline was approved by the Head of School. No alteration of this course outline is permitted without Head of School approval. If a change is approved, students will be notified and an amended course outline will be provided in the same manner as the original.